Improving the ARFORGEN Model: An Army National Guard Perspective

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by
MAJ Andrew R. Dziengeleski
Army National Guard

School of Advanced Military Studies
United States Army Command and General Staff College
Fort Leavenworth, Kansas

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Approved by:

_____ Alexander J. Ryan, Ph.D.	Monograph Director
_____ Charles Webster, COL, IN	Monograph Reader
_____ Stefan Banach, COL, IN	Director, School of Advanced Military Studies
_____ Robert F. Baumann, Ph.D.	Director, Graduate Degree Programs

Abstract

IMPROVING THE ARFORGEN MODEL: AN ARMY NATIONAL GUARD PERSPECTIVE, by MAJ Andrew R. Dziengelski, ARNG, 41 pages.

The purpose of this monograph is to provide a new lens to view the ARFORGEN model, as it has largely been accepted without constructive criticism or analysis of its impacts since its inception in 2006. This monograph is an attempt to synthesize elements of complexity science, the Army Force Generation (ARFORGEN) model, and Army National Guard (ARNG) Brigade Combat Team (BCT) deployments since 1999. In addition, there have been numerous policy memoranda issued by various levels of command throughout the Defense Department that have affected the ARFORGEN model and the ARNG BCT's. The analysis of these memos attempt to show the non-linearity associated with policy and the ARFORGEN model.

The content of this monograph is based on complexity science concepts and theories, as well as multiple Department of Defense policy letters, Congressional testimony by senior Defense Department leadership, a case study of the 39th Infantry Brigade Combat Team of the Arkansas Army National Guard, and the development of a mathematical modeling product based off commercially available queuing computer software.

The findings of this monograph show the decrease in dwell time for ARNG BCT's since ARFORGEN was implemented in 2006. The Office of the Secretary of Defense 12-Month Mobilization Policy for Reserve Component units--which became official in 2007--further exacerbated the lack of dwell time for ARNG BCT's. The U.S. Army RESET model for equipment also limits the amount of training time within the first year of ARFORGEN, which leads to cascading negative effects on the BCT's overall readiness. The findings also highlight that ARFORGEN was not implemented in a vacuum--the ARNG BCT's have provided forces from 1999 to the present, and the demands for ARNG BCT's from various Combatant Commands has not diminished since that time.

The monograph provides a series of recommendations to increase the amount of dwell time for ARNG units and ARNG soldiers. Due to the unique nature of Reserve Component personnel, additional dwell time can only benefit their families and their employers. With a revision of existing policies and the creation and execution of an ARFORGEN education block of instruction taught either on-line or at resident Army schools, the ARNG can continue to provide BCT's to the Combatant Commands as fully equipped, fully manned and fully trained units who are ready to fight and win the nation's ground campaigns today and in the future.

This monograph is dedicated to the memory of my mother, Christina M. Dziengeleski, who passed away unexpectedly on September 10th, 2009.

TABLE OF CONTENTS

ILLUSTRATIONS

Page

TABLES

Page

Improving the ARFORGEN Model: An Army National Guard Perspective

> The more mechanical become the weapons with which we fight, the less mechanical must be the spirit which controls them.
>
> Major-General J. F.C. Fuller[1]

Introduction

In 2006, the U. S. Army instituted the Army Force Generation (ARFORGEN) model. This model was, and is, an attempt by the senior leadership of the Army to provide ready and trained units to Combatant Commanders and to introduce more predictability of mobilizations and deployments for the Reserve Components of the Army. The Army National Guard, specifically the Brigade Combat Teams (BCTs), have been greatly affected by the ARFORGEN process over the last three years as greater demands have been placed on these units to perform missions in support of the Long War and other overseas operations. These demands are exacerbated by a unit supply and demand system where the demanding Combatant Command must wait for the Service to supply forces. Because of the inherent disconnect between these two systems, the available supply of forces quickly becomes exhausted because demand from the Combatant Commanders has outstripped the ability of the Army to supply forces. This results in an ARFORGEN cycle which is much shorter than expected for the ARNG BCTs. In addition, numerous policy decisions from the Office of the Secretary of Defense level, through the Department of the Army level, and even down at the State level.

This monograph is organized in a simple manner. The introduction provides an overall concept of the paper, along with the thesis statement. The Literature Review focuses on complexity science, and how this new science provides concepts and theories that act as a lens in which ARFORGEN can be analyzed and described. With the emergence of new concepts and

[1]J. F. C. Fuller, *On Generalship* (Harrisburg, PA: Military Service Publishing Company, 1936), 1.

theories within complexity science over the last decade, this section describes how complexity science relates to the ARFORGEN model. The section titled, Domination of Policy, examines various policies from the Secretary of Defense level through the Army National Guard level and how these policies have been enacted with little regard to ARFORGEN. In addition, the effects of these policies are analyzed through the lens of complexity theory and current military operations. The section titled, ARFORGEN--39th IBCT, is a case study of the 39th Infantry Brigade Combat Team from the Arkansas Army National Guard. It is necessary to conduct a specific unit case study in order to provide the critical context of this unit within time and space. ARFORGEN was implemented in 2006 and the Army National Guard had been deploying units from Brigade Combat Teams since 1999. It is essential to understand how ARFORGEN impacted a unit which had already deployed once in its entirety, and had mobilized battalion and company sized units multiple times prior to the implementation of ARFORGEN. The section titled, Modeling ARFORGEN, is dedicated to modeling the ARFORGEN cycle, using the current pre- and post-mobilization training timelines, the current demand for ARNG BCTs, and the specific missions they are performing. This modeling is critical as it allows the average dwell time to be analyzed at the unit level with current demands on the BCTs. The conclusion provides a number of recommendations not only to extend dwell time for the ARNG BCTs, but also to maximize training time during that dwell time. It also offers a number of educational measures with regards to ARFORGEN and policy memoranda--officers must be educated on how ARFORGEN works, and how some of the current policies have reduced dwell time for the ARNG BCTs. Finally, the paper ends with a number of suggestions for future learning, as the novelty of ARFORGEN has not led to widespread academic discussion in the public realm as of today.

Literature Review

By analyzing and synthesizing information viewed through the lens of complexity science, it is possible to understand and then improve the ARFORGEN model, and return the Army National Guard BCTs to the initial state promised by the first ARFORGEN model: a one in six year model. The one in six year model is simple: for every year a unit deploys, it is expected to have five years of dwell time at home station. This is critical because it allows for a deeper force pool of ARNG BCTs over a longer period of time, which in turn allows the ARNG to provide a consistent flow of forces to the Combatant Commanders. In addition, job security for traditional Guardsmen must be considered, as they are dependent on these jobs for their livelihood when not mobilized and deployed. The ARFORGEN model has changed so dramatically for these units, current usage rates have compressed to less than a one in four-year cycle. Mathematical modeling supports this claim, and with the supporting evidence located within this paper, it is easy to show proof of the compressed model for ARNG BCTs. The ARNG BCTs are the major combat reserve of the United States of America, it is necessary to establish conditions that allow for the sustainability of these forces for the Long War and establish a more consistent level of predictability for the families, employers, soldiers, and units impacted by the changes that have occurred from 2006 to 2009.

Complexity science is an emerging blend of mathematics, natural sciences, and the social sciences. The roots of complexity science start in the 1980s, with the understanding that a reductionist view of science, which had dominated Western culture since the 17th Century, was not applicable to the rising complexity seen within mathematics and physical science. A new approach, heavily based in experimental mathematics, began to understand that seemingly unrelated events could actually be connected. The focus on complexity grew exponentially with the creation of the Santa Fe Institute in 1985, and it is still the leading think tank on complexity science. Complexity science is innovative and new, there are a number of concepts that have to

be captured from different professors and complexity scientists in order to understand how ARFORGEN can be examined in a new manner.

The initial question must be defined: what is *a complex system*? Since ARFORGEN is clearly a system designed to produce trained and ready units, can it be a complex system? Melanie Mitchell, author of *Complexity: A Guided Tour*, defines a complex system as, "A system in which large networks of components with no central control and simple rules of operation give rise to complex collective behavior, sophisticated information processing, and adaptation via learning or evolution."[2] Robert Axelrod and Michael Cohen, in *Harnessing Complexity*, add more context with their definition of complex system as "A system is complex when there are strong interactions among its elements, so that current events heavily influence the probabilities of many kinds of later events."[3] These definitions provide a baseline to understanding how ARFORGEN can be considered a complex system. The ARFORGEN model itself is not complex. However, due to the interaction of the Combatant Commanders and numerous policy letters, it becomes complex.

Two valuable concepts are *macrostates* and *microstates*. Microstates are the variables within the BCTs, such as equipping levels, training proficiency level and personnel levels, so these microstates have impacts on each BCT. The variables within the ARFORGEN model itself are the macrostate. These variables include demand from the Combatant Commands, the available supply of BCTs for current operations, and the average dwell time for the BCTs. These variables--from the microstate and macrostate--impact every BCT within the Army, and these variables are in a constant rate of flux.

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[2]Melanie Mitchell, *Complexity: A Guided Tour* (New York: Oxford Books, 2009), 13.

[3]Robert Axelrod and Michael D. Cohen, *Harnessing Complexity: Organizational Implications of a Scientific Frontier* (New York: The Free Press, 1999), 7.

Yaneer Bar-Yam, author of *Making Things Work*, highlights the importance of the concept of *interdependence* within complexity science. He uses an analogy to define interdependence; "Pushing on a complex system 'here' often has effects 'over there' because the parts are interdependent."[4] The numerous policies issued by various Commands and Headquarters have an interdependent effect--they affect the macrostate of ARFORGEN itself, and the microstates of the BCTs. The microstates are the most affected by the interdependence of the ARFORGEN model, the various policies, and by the consistent demand for forces from the Combatant Commanders. They are affected by the trickle-down effect of policy from higher headquarters, and by a supply and demand system that does not allow them a real place to interject themselves. They are simply expected to train, mobilize, deploy, conduct their mission, and de-mobilize. Bar-Yam also defines the critical complexity science concept, known as emergence, as the "Dynamic emergence of new types of systems 'new emergent forms'."[5] This is when a completely new and novel system emerges, with cascading effects throughout other systems.

Emergence is important to the ARFORGEN model and the ARNG BCTs because the model has changed dramatically since 2006. The emergence of new policies, the emerging use of ARNG BCTs for Title 32 missions, and the emerging demands for ARNG BCTs from Combatant Commanders have led to an altered ARFORGEN model in 2010. The demands of the Combatant Commands have led to an emerging dependence on the ARNG BCTs, and the emerging policy documents since 2006 have led to a more compressed ARFORGEN model for these forces.

External shocks in the form of approved DOD policy--with little or no regard to their impacts on the ARFORGEN model--can create a scenario where catastrophic collapse may occur.

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[4]Yaneer Bar-Yam, *Making Things Work* (Cambridge, MA: Knowledge Press, 2004), 27.

[5]Yaneer Bar-Yam, "A Mathematical Theory of Strong Emergence Using Multiscale Variety," *Complexity*, 9 (March 2004), 17.

Jenny W. Rudolph and Nelson P. Repenning define catastrophic collapse as "…catastrophic outcomes can be the result of an overaccumulation *(sic)* of mundane events, any of which, on its own, poses little threat to the organization."[6] They also add "Even more problematic, when people recognize an impending crisis, attempts to implement an alternative response can often make the situation worse rather than better."[7] This can be seen with the implementation of the 12-Month Mobilization Policy, which has led to shorter dwell times for ARNG BCTs since 2007. Niall Ferguson explains how these small changes can work against the desired effects as "A small input to such a system can produce huge, often unanticipated changes--what scientists call "…the amplifier effect."[8] The 12-Month Mobilization Policy is a great example of how a seemingly minor policy, designed to benefit a 360,000-person organization, actually altered an existing system to the determent of the people within that system. Ferguson also believes "What matters most is that in such systems a relatively minor shock can cause a disproportionate--and sometimes fatal--disruption."[9] This paper is an attempt to describe the changes within ARFORGEN over time in order to prevent such a fatal disruption from occurring.

Another concept is the *artifact*. Artifacts, as defined by Robert Axelrod and Michael Cohen, are, "Objects used by agents. Like agents, they can have important properties, such as location or capabilities."[10] The majority of artifacts impacting the ARFORGEN system are various policy papers from a myriad of different staffs on a variety of different subjects. It is essential to note that these artifacts are not part of the ARFORGEN model, but they have multiple

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[6]Nelson P. Repenning and Jenny W. Rudolph, "Disaster Dynamics: Understanding the Role of Quantity in Organizational Collapse," *Administrative Science Quarterly*, (2002), http://interruptions.net/literature/Rudolph-ASQ02.pdf. (accessed March 24, 2010.)

[7]Ibid., 25.

[8]Niall Ferguson, "Complexity and Collapse: Empires on the Edge of Chaos," *Foreign Affairs*, (March/April 2010): 25.

[9]Ibid., 26.

[10]Axelrod and Cohen, 6.

impacts upon ARFORGEN and the units within the model. These impacts make ARFORGEN a complex system, as it adapts to the policy memoranda in its environment that have an effect on the model (the macrostate) and the BCTs (the microstates).

Another critical concept to understanding the ARFORGEN model using complexity science is that of *counterintuitiveness.* Counterintuitiveness, according to Jamshid Gharajedaghi, "…means that actions intended to produce a desired outcome may, in fact, generate opposite results."[11] This idea is essential because a few of the policies that have been issued, specifically the OSD 12-Month Reserve Component Mobilization Policy, have actually created additional entropy because this policy created two mobilization cycles per year, thereby forcing ARNG BCTs to deploy more frequently than before this policy was enacted.

Two other complexity concepts that must be understood are those of *loose coupling* and *tight coupling*. Charles Perrow writes in *Normal Accidents* "Tight coupling is a mechanical term meaning there is no slack or buffer or give between two items. What happens in one directly affects the other."[12] Loose coupling, conversely, "…allows certain parts of the system to express themselves according to their own logic or interests. Tight coupling restricts this."[13] ARFORGEN is an unusual mix of both forms of coupling as it attempts to harmonize the unique systems of the Army in order to provide trained and ready units for the Combatant Commands, which is a form of tight coupling ARFORGEN dictates equipping requirements, funding requirements, manning requirements, and training requirements--all depending on what year a unit is at within the model. At the same time, many of the policy letters are a form of loose coupling, as they have been created in order to serve specific interests, such as the Reset Policy.

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[11]Jamshid Gharajedaghi, *Systems Thinking: Managing Chaos and Complexity: A Platform for Designing Business Infrastructure*, 2d ed. (New York: Elsevier, 2006), 49.

[12]Charles Perrow, *Normal Accidents: Living With High-Risk Technologies* (New York: Basic Books, 1984), 90.

[13]Ibid., 92.

Reset Policy dictates that the ARNG BCTs will not get their equipment for a year after de-mobilization. The irony is that both forms of coupling can and have been detrimental to both the microstates of the BCTs as well as the macrostate of the ARFORGEN model.

The final two concepts of complexity science that need to be used in this study are the concepts on *linearity* and *non-linearity*. Mitchell defines a linear system as "One you can understand by understanding its parts individually and then putting them together."[14] Danah Zohar, author of the book *Rewiring the Corporate Brain*, adds context as "Many a Newtonian organization has created a bureaucratic Frankenstein's monster with its emphasis on top down control, tight structure and imposed plans and solutions, and its obsession with efficiency."[15] ARFORGEN is a linear, Newtonian attempt to institute top down control from the senior leadership of the Army upon a decidedly non-linear process of readiness and deployments. Mitchell offers up a simple understanding of what a non-linear system is, "A non-linear system is one in which the whole is different than the sum of the parts."[16] ARFORGEN has become non-linear because of the supply and demand system between the Combatant Commands and the Army, because of the numerous policies that the Army has little or no control over. Because of this non-linearity, what seem like minor changes to existing policy create disproportionate ripple effects throughout the ARFORGEN process. This non-linearity is a major issue for traditional hierarchies, as Zohar writes, because "Newtonian organizations divide the world into the organization and its environment, the organization and its market. They seek to manage (control) that environment and to exploit the market. Natural resources are just that, resources to be used."[17] The ARFORGEN model is an attempt to create a linear process that supposedly

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[14]Mitchell, 22.

[15]Danah Zohar, *Rewiring the Corporate Brain* (San Francisco: Barrett-Koehler Publishers, Inc. 1997), 53.

[16]Mitchell, 22.

[17]Zohar, 53.

promises a well thought out plan, with the ultimate goal being a "steady state", which is otherwise known as equilibrium.

Complexity science has allowed for a new way of viewing organizations and organizational policies and processes. These concepts allow for a new examination of the ARFORGEN model, the emergence of policies designed to benefit the individual and the unit, the supply and demand system, the desire for control and the narratives issued by the senior Army leadership. While it allows for the identification of issues and problems, it also provides a way to improve the model, and this in turn will benefit the individual soldier, his unit, and the Combatant Command requesting forces.

The Domination of Policy

> Army officials we spoke with indicated that until the Army's operational commitments decrease, ARFORGEN will not reach its steady state.[18]

This is a very common view of why ARFORGEN is not succeeding, especially from senior commanders or their staff officers. While it is true that demand from the Combatant Commanders has exceeded the Army's capacity to provide trained and ready ARNG BCTs, it is only one of many current issues surrounding ARFORGEN and its impact on the ARNG BCTs. There are a number of policy memorandums that have impacted the macrostate of ARFORGEN and the microstates of the ARNG BCTs. These policy memorandums have reduced the length of the ARFORGEN cycle, they have reduced the amount of training time within the cycle, and they have given the solider less predictability than ever. Four major actors impact the ARNG solider during his military service. He is impacted by his individual service--when does he go to school for the Army, when does he train with his unit, and when does he expect to deploy. After his

[18]Government Accounting Office, "Actions Needed to More Fully Develop the Army's Strategy for Training Modular Brigades and Address Implementation Challenges" (August 6, 2007), http://www.gao.gov/new.items/d07936.pdf (accessed December 1, 2009).

individual concerns, the unit then impacts him--when it falls into the ARFORGEN cycle and when it is supposed to deploy. These two actors impact his family--the third actor, as predictability is desirable for his family members. Finally, his employer impacts him--the employer is the major difference between an Active Component solider and an ARNG solider. The ARNG solider is a part-time soldier, dependent on a full time job for benefits and employment. A more stable and predictable model would be a great benefit to the employers as well. The initial ARFORGEN cycle was supposed to be a "One in Six" model, as "Guard units will train under a 6-year cycle spending approximately four years in reset/train and one year each in the ready and available pools."[19] The policies enacted since 2006 have created great stress amongst all four of these actors. General Charles Campbell, commander of Forces Command, highlighted the lack of clarity within the ARFORGEN model by providing two differing definitions of ARFORGEN "The Department of the Army views ARFORGEN as a 'supply based model' in order to inform a corporate approach to programmatic *(sic)* and as a methodology to communicate force generation requirements. Forces Command (FORSCOM), however, views ARFORGEN as a 'demand-based process' to systematically build unit readiness on requirements identified by both the combatant commanders and the Army."[20] The Army, as an organization, does not provide a common definition of ARFORGEN, and this lack of clarity with sub-organizations of the Army has led to increased confusion about the ARFORGEN model. The lack of clear definition has led ARFORGEN to become whatever a specific staff wishes it to be. The Army Campaign Plan then adds a critical comment on when the ARNG will become an Operational Reserve: "the intent for this plan is to fully implement the endstate operational RC

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[19]Ibid., 2.

[20]Charles C. Campbell, "ARFORGEN: Maturing the Model, Refining the Process" *Army Magazine* (June 2009), http://www.ausa.org/publications/armymagazine/archive/June2009/Documents/Campbellv2060109.pdf (accessed April 14, 2010).

[Reserve Component] described in the Army's AI4 Concept Plan…by 2019."[21] The Army Campaign Plan then admits that "the current global demand for forces will prevent the Army from achieving its deployment planning goals in the foreseeable future."[22] In the 2009 Army Posture Statement to Congress, General Casey, the Chief of Staff of the Army, and Mr. Pete Geren, the Secretary of the Army, testified that the goal for the ARNG was to "Achieve a degree of balance by reaching a ratio of…one year deployed to four years at home for Reserve Component units by 2011."[23] This is one year less than the initial model which provided for five years at home before the next potential mobilization (when the unit enters the "Ready" year of the model). Even by 2011, the ARNG will have never reached a "steady state" model of one year deployed to five years at home since the model began in 2006. While the demand from Combatant Commands has exceeded the capabilities of the Army to provide forces in a timely manner, it is necessary to examine the policies enacted from 2006 through the current day, and identify how these policies have shrunk the ARFORGEN cycle, and the stresses caused by changes in the microstates and actors within the ARNG BCTs.

The most important policy since ARFORGEN was enacted is the Secretary of Defense's "Utilization of the Total Force" memorandum. This policy was approved on January 19, 2007, and it created a new paradigm for the deployment of ARNG BCTs. It states, "from this point forward, involuntary mobilization for members of the Reserve Forces will be for a maximum one year at any one time."[24] This policy artifact has had a huge impact on the ARFORGEN cycle because it limits Title 10 time to 365 days. Within those 365 days, ARNG BCTs have to conduct

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[21]Department of the Army, "ANNEX I (Transition the RC Into an Operational Force) to Army Campaign Plan," (Coordinating Draft), 15 August 2009, I-3.

[22]Ibid., F-5.

[23]U.S. Congress, Senate and House of Representatives, *A Statement on the Posture of the United States Army 2009*, 111th Cong., 1st sess., 2009, 7.

[24]Robert M. Gates, U.S. Department of Defense, *Memorandum for: Secretaries of the Military Departments, Chairmen of the Joint Chiefs of Staff, Undersecretaries of Defense: Utilization of the Total Force*, Washington D.C. (January 19, 2007).

post-mobilization training, and this training usually takes between 54-72 days depending on the mission requirements. [25] That leaves seven to nine months of "Boots on Ground" time in theater. Army Magazine defined the "4+1 BCT" requirement in 2008. "To meet Central Command's security force and Afghanistan National Army training requirements, First Army, ARNG, and FORSCOM partnered to mobilize and deploy five ARNG brigade combat teams, referred to as 4+1 Brigades. This deployment was the first major mobilization under the 2007 Secretary of Defense policy, Utilization of the Total Force."[26] This number, however, does not include ARNG BCTs used for "Full Spectrum" missions in Iraq. In 2009, the ARNG had two full spectrum missions--the 30th HBCT and the 56th SBCT--which will not be backfilled by ARNG units. The ARNG mobilization load for 2009 was 12 BCTs out of 28 BCTs. Although the mobilization load is expected to decrease in 2010, BCTs must be moved forward in the cycle in order to provide available forces in case they are required. This leads to increased instability both within the ARFORGEN macrostate and the BCT microstate. The Secretary of Defense 12-month mobilization policy has led to at least a doubling of the current mobilization load, which reduces the ARFORGEN cycle from a one in six-year model to a one in three-year model, or in the case of 2009, to less than a one in four-year model. The ARNG is nowhere close to reaching a steady state, and it is necessary to relook the Army narrative of "steady state" because of the increased instability caused by Secretary Gates' policy memo. This policy is a great example of the lack of counterintuitive thinking. By shortening the mobilizations of Reserve Component personnel to 12 months, Secretary Gates was seen as providing a benefit to Reserve Component personnel. With the demand for ARNG BCTs steady at 12-14 per year within Central Command alone, this

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[25]Charles C. Campbell, "Remarks to the Infantry Warfighting Conference," (lecture, Fort Benning, GA, September 23, 2009) https://www.benning.army.mil/iwc/Video%20Components/slides/allslides/cambell.pdf (accessed December 5, 2009).

[26]Charles C. Campbell, "FORSCOM: Anticipating Continued Worldwide Presence," *Army Magazine* (*October* 1, 2008), http://www.thefreelibrary.com/FORSCOM:+Anticipating+Continued+Worldwide+Presence-a01611685068 (accessed on October 17, 2010).

policy--because of the post-mobilization training time--created a second mobilization cycle per year, and while ARNG BCTs are not mobilized for 18 months as they were from 2004 to 2006, they are now mobilized more often over a shorter period of time. Instead of one 18-month mobilization over a five year period, ARNG BCTs may spend as long as 24 months mobilized over a six year period because of the consistent demand and this policy.

This narrative has emanated from the senior leadership of the Army, and it must change to stop setting false expectations for soldiers in ARNG BCTs. It must change because there is no such system that can ever reach a steady state. The Army Posture statement defines "steady state" as "Cumulative day-to-day activities, such as partner capacity building with our allies, peacetime military engagement required to defend the homeland, irregular operations, and the capability to conduct and win conventional campaigns to prevail in the war on terror."[27] This document then defines a surge as "Those requiring forces to support combatant commanders operations beyond programmed levels. These requirements include the capability to wage two nearly simultaneous conventional campaigns or one conventional campaign if already engaged in a large-scale, long-duration irregular campaign."[28] Even if force levels can be programmed, which is doubtful since the Combatant Commanders do not control the supply of forces, the definition of both surge and steady state are problematic, but for different reasons. These reasons are critical to understanding how ARFORGEN is not meeting the sustainability requirements for the ARNG BCTs. Melanie Mitchell provides a useful framework to describe ARFORGEN, and this framework is known as a dynamical system. Mitchell writes, "Dynamical systems theory (or dynamics) concerns the description and prediction of systems that exhibit complex changing behavior at the macroscopic level, emerging from the collective actions of many interacting components. The word dynamic means changing and dynamical systems are systems that change

[27]Ibid.

[28]Ibid.

over time in some way."[29] Because ARFORGEN is a dynamical system, it can never reach a steady state. In fact, there are no steady states within nature. Mitchell writes, "Even rocks change over geological time."[30] Another simple analogy that shows how a steady state does not exist in nature is by looking at water, a simple substance consisting of two atoms of hydrogen and one atom of oxygen. Water can exist in three states: gaseous (steam), liquid (water) and solid (ice). Water can shift from one state to another just by lowering or raising the temperature. ARFORGEN changes over time because of decreased or increased demand from the Combatant Commands, or it can be affected because of policies created by the highest levels of the Department of Defense. The bottom line is ARFORGEN can never reach a steady state, because the demand from the Combatant Commands will always fluctuate, new policies will emerge that affect the macrostate of ARFORGEN and the microstates of the BCTs, and because of political pressures to reduce the demand on Reserve Component BCTs.

Another policy that greatly impacts the ARNG BCTs is the Headquarters, Department of the Army, Equipment Reset policy. This policy was enacted to refurbish and refit the equipment that the BCT was mobilized and deployed with after their tour was complete. The Department of the Army highlighted its intentions for Reset in the ARNG in a September 2008 policy memo, which stated, "The equipping intent for pilot units is to have at least an S2 level of equipment on hand (EOH) at…Return + 365 days but NLT Return + 730 days for RC, so they are prepared to begin focused collective training in the Train/Ready phase."[31] In a "steady state" ARFORGEN model, ARNG BCTs would send soldiers to school, and perform individual level and some crew level training. Without their equipment in the first year, ARNG units are forced to concentrate on professional development training, and individual level training tasks. The existing shortages of

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[29]Mitchell, 15.

[30]Ibid., 16.

[31]U.S. Department of the Army, *Fragmentary Order 2 To Execution Order: RESET PILOT (FY08) (U)*, Headquarters, Department of the Army, (Washington, D.C., 2008), 2.

equipment in the ARNG have exacerbated this problem as well. In May 2009, Major General Carpenter, the Acting Deputy Director of the Army National Guard, testified to the House Armed Services Committee that "Fill rates declined to approximately 40 percent of equipment available to the Governors in 2006, due to cross leveling equipment to support immediate deployment requirements. As of September 2008, 76 percent of the ARNG Modified Table of Organization and Equipment the equipment is on hand…."[32] The lack of equipment in the ARNG forces units to cross level equipment so units can train successfully, and since there is a finite amount of equipment within each state, the priority of equipment fill has been to deploying or about to deploy units (within a year of mobilization). The unique nature of the ARNG, the BCTs are also expected to perform missions for the Governors in times of emergency. Major General Carpenter also highlighted the lack of "dual use" equipment--equipment that is usable for Title 32 and Title 10 missions as, "The national average of Critical Dual Use equipment available to the Governors is 65 percent."[33] Even at the current funding rate, Major General Carpenter claims that "The ARNG of fiscal year 2015 will approach a 90 percent equipment-on-hand level…."[34] It will take over 14 years since the beginning of the Global War on Terror and over nine years since the implementation of ARFORGEN for the ARNG--and its BCTs- to reach a 90 percent level of equipping. The dynamical system of equipping the force and the Reset policy specifically, have created less time for units to train as the equipment often is not available until a year after de-mobilization.

Because of the lack of equipment, ARNG BCTs must rely on other units to donate equipment to them for training until the equipment comes out of the Reset program a year after they have demobilized. In the short term, the trading of equipment from one unit to another

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[32]U.S. Congress, House Armed Services Committee; Subcommittee on Air and Land Forces, *On Army and Air National Guard Equipment Programs,* 111th Cong., 1st sess., 2009.

[33]Ibid., 3.

[34]Ibid., 2.

raises two immediate concerns. Number one, the increased use of the equipment raises maintenance costs as it gets used more frequently. In a worst-case scenario, equipment is broken and must be replaced. Secondly, the trading of equipment becomes a readiness "shell game" as one unit can report that they are meeting readiness requirements because they have the pacing items on hand, even if it is in a temporary status. The BCTs are additionally constrained by the tight coupling of the ARFORGEN model when they redeploy from their missions. The initial year of ARFORGEN is supposed to allow for Officer and Non-Commissioned Officer professional education, which potentially can take the solider away from their employers if they attend an Active Component school such as the Officer Basic Course or the Command and General Staff College. Certain collective training requirements, such as tank and Bradley gunnery, are also mandatory requirements for units in Year 1 of the ARFORGEN cycle. The 365-Day Reset policy does not allow for these units to shoot gunnery, unless they have left their heavy equipment back at home station during their deployment and used pre-positioned equipment stocks during their deployment (this has been a common practice, but it is not an established policy).

A Case Study for ARFORGEN--the 39th IBCT

The 39th Infantry Brigade Combat Team (IBCT) of the Arkansas Army National Guard (AR ARNG) is a telling example of how an ARNG BCT has been utilized in the post-September 2001 operational environment. This unit deployed more frequently for operational missions than any other ARNG BCT through 2010. They, like the other 27 ARNG BCTs, are affected by the new ARFORGEN cycle, as well as the key policies that affect the ARFORGEN rotation. The 39th IBCT is a "canary in the coal mine" for the long-term impacts of repeated deployments over an extended period. By analyzing their missions over the last decade, it is possible to identify the impacts of ARFORGEN and the related strategic policies which have caused a great deal of stress on the unit and its soldiers.

In 1999, the 39th Enhanced Separate Brigade (eSB) was one of 15 enhanced brigades in the Army National Guard. It was composed of three infantry battalions, a field artillery battalion, a support battalion, a separate cavalry troop, a military intelligence company, an engineer company, and an air defense battery (located in Illinois). In 2005, the 39th IBCT converted to the standard Light Infantry Brigade Combat Team organization, and is now composed of the 1-151st Cavalry (RSTA) Squadron, the 1-153rd Infantry Battalion, the 3-153rd Infantry Battalion, 1-206th Field Artillery Battalion, the 39th Brigade Support Battalion and the 39th Brigade Special Troops Battalion. The entire Brigade Combat Team is now located within the borders of Arkansas, and this is significant because the state of Arkansas is responsible for providing the personnel and training for this unit. With the consistent demand for trained and ready personnel and units, the unit has struggled to meet the personnel requirements for their post-9/11 missions in support of Operation Iraqi Freedom. The BCT is also known as the "Bowie" Brigade after Jim Bowie, a legendary frontiersman, or the "Diamond" Brigade because Arkansas is the location of the only operational diamond mine in the United States. Both the Bowie Knife and the Diamond are represented on the shoulder sleeve insignia of the 39th IBCT.

The 39th IBCT is a fascinating case study because it was one of the few Army National Guard Brigades to supply significant forces to operational missions prior to the 9/11 attacks on New York City and Washington D. C. It has also undergone two significant organizational changes since 1999--the Brigade was one of three ARNG Enhanced Separate Brigades reporting to the 7th Infantry Division Headquarters at Fort Carson, Colorado, and the 39th BDE reorganized in 2005 and became an Infantry Brigade Combat Team. The BCT has supplied forces for seven different major operations from 1999 to 2008. Elements, and in some cases, the entirety of the 39th IBCT have deployed to Saudi Arabia, Bosnia, the Sinai, Operation Iraqi Freedom (2003-2005), New Orleans, Louisiana in support of Hurricane Katrina relief operations, Operation Jump Start along the Mexican border, and Operation Iraqi Freedom (2007-2008). The 39th IBCT has the highest Operations Tempo (OPTEMPO) of any ARNG BCT in the last decade,

and while ARFORGEN was not fully implemented until 2006 in the ARNG, it did have significant impacts on two deployments in this period. The current ARFORGEN cycle, as well as the Operational Demand for ARNG BCTs, as shown by the Planimate software models in figure 1, will only increase the OPTEMPO for the 39th IBCT in the future. With these deployments now resigned to history, the focus must be on the current usage rate of 1:3.58 as shown by the mathematical modeling in Chapter 5.

The first mission for the 39th Enhanced Separate Brigade (eSB) was conducted under Operation Southern Watch. This operation was described in the 2001 Army National Guard Annual Posture Statement "A company level force protection mission began with the mobilization and deployment of two infantry companies with 272 soldiers from the 39th eSB (Arkansas ARNG) in May 1999. A second rotation of two infantry companies, one from the 39th eSB (Arkansas ARNG) and the other from the 41st eSB (Oregon ARNG) with 272 soldiers, mobilized and deployed in September 1999."[35] This was the first Federal (Title 10) mobilization of the Arkansas Army National Guard since its inception in 1967. The Globalsecurity.org website states, "Two Arkansas Army National Guard infantry units served in central Saudi Arabia in 1999 to support the U.S. military presence in the Persian Gulf. The mobilizations of 266 citizen-soldiers…were on active duty for a total of 155 days."[36] The relatively short duration of this deployment was due to the limitations of the Presidential Selective Reserve Call Up (PSRC). An April 27, 1999 news release by the Office of the Secretary of Defense defines the limitations of the PRSC quite well, "Title 10, United States Code, section 12304 authorizes the statutory call to active duty of up to 200,000 members of the Selected Reserve and the Individual Ready

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[35]U.S. Department of Defense, *2001 Annual Posture Statement*, U.S. Army National Guard, http://www.arng.army.mil/News/publications/Posture%20Statement/2001/missioning%2 the%2 force.htm (accessed January 16, 2010).

[36]Globalsecurity.org, "3-153rd Infantry Battalion," http://www.globalsecurity.org/military/agency/army/3-153in.htm (accessed January 16, 2010).

Reserve, of whom not more than 30,000 may be members of the Individual Ready Reserve, for 270 days when deemed necessary to augment the active component for any operational mission. This period includes time for mobilization, demobilization, and accrued leave. The effective tour length for a reservist in support of NATO operations will be about six months."[37] Prior to the 9/11 attacks, the PSRC was the most effective process to mobilize and deploy Reserve Component forces into operational environments. The PRSC is a good example of a tightly coupled system, as it limits the amount of Reserve Component soldiers as well as the time these soldiers can be deployed under this statute.

The second significant mobilization for the 39th eSB occurred in 2001, soon after their participation in Operation Southern Watch had ended. Two units of the 39th eSB, the 1-153rd Infantry Battalion and the 3-153rd Infantry Battalion, each provided an infantry company for Operation Joint Force in Bosnia. These companies were part of Task Force Eagle, which was built around 3-7 Cavalry from the 3th Infantry Division. According to the June 16, 2001 newsletter *Talon*, "The 1st and 3rd battalions of the 153rd Infantry augment the Fort Stewart-based 3-7Cavalry. Approximately 350 soldiers at Camp McGovern are from the reserve components…."[38] These two companies were also mobilized under the PSRC but there is no public information on how long these units were mobilized for.

In October 2001, the 2-153rd Infantry Battalion, the third infantry battalion of the 39th eSB at the time, was mobilized in support of Multi-National Force and Observers, Sinai, Egypt. According to the Mountaineer newspaper of Fort Carson, Colorado, "Known as the "Gunslingers," the 2nd Bn., 153rd Infantry, will be the first pure National Guard unit selected for

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[37]U.S. Department of Defense, "Secretary Cohen Announces Presidential Selected Reserve Call Up," Office of the Secretary of Defense, (Washington, D.C., April 27, 1997), http://www.defense.gov/releases/release.aspx?releaseid=2066 (accessed January 16, 2010).

[38]Lisa Dunphy and Daniel Lucas, *Task Force 3-7 Cavalry: Working for Safe and Secure Brcko Task Force Eagle* (June 16, 2001), http://www.tfeagle.army.mil/tfetalon/talon_archive/2001/talon%202001-06-16.pdf (accessed January 16, 2010).

this mission in the nearly 20-year history of the MFO."[39] The article also mentions other elements of the 39th eSB were part of this force package. "While the majority of those headed to the MFO are from 2nd Battalion personnel from other units, including the 239th Engineers (Booneville), Military Police Platoon (Little Rock), medical professionals from the 39th Support Battalion (Hazen), and members of 3rd Battalion (Warren) round out the task force."[40] The mission in the Sinai was another six month mobilization, according to a website biography of Major General Ron Chastain, who was the commander of the 39th eSB at the time.[41]

In March 2003, the United States Army, along with the other services of the Department of Defense, invaded the sovereign nation of Iraq. By the end of 2003, it was becoming apparent to the leadership of the Department of Defense that the initial goals of the invasion were not going to be met in the short term. In order to meet the growing demands of the commanders in Iraq, additional forces would be required to train and deploy to Iraq to quell the growing insurgencies within the country. The Army National Guard deployed two Divisions in the Korean War. The Army National Guard was going to deploy BCT-size formations into combat for the second time since World War Two. One of the first three Brigades chosen was the 39th eSB, who had significant operational experience from Operation Southern Watch, Operation Joint Forge, and the MFO-Sinai mission. In accordance with the Department of Defense policies, the 39th eSB was activated and federalized in October of 2003. According to website biography of Major General Ron Chastain, the 39th eSB commander at the time, in "October of 2003, the 3,000 soldiers making up the 39th Infantry Brigade began four months of additional training at Fort Hood, Texas, in preparation for an 18-month deployment to Iraq. They shipped out to Iraq

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[39]Derald Neugebauer "Arkansas Army National Guard selected for Sinai-MFO mission," (November 16, 2001), http://public.carson.army.mil/sites/pao/mountaineer/archives/ 2001%20Archive/11-16-01.pdf (accessed January 16, 2010)

[40]Ibid.

[41]Major General Ron Chastain,"Maj.Gen. Ron Chastain, U.S. Military" http://www.chastaincentral. com/ content/ ron.html#39 (accessed January 16, 2010).

the following March."[42] The 18-month mobilization created a number of issues for the Guardsmen of the 39th eSB. Initially, the 39th could not meet their manning requirements, so, "The 39th enlisted the support of units from nine other states to fill the gap."[43] This shortage of personnel required an infantry battalion from another state to fill the personnel requirements. According to an article published on July 4, 2009, the Salem-News.com website reported that, "The 2-162 Infantry deployed to Iraq as part of the 39th Infantry Brigade (Enhanced) under the Arkansas National Guard. The Battalion served in Baghdad and other parts of Iraq, suffering a number of casualties while conducting stabilization security missions."[44] A light infantry battalion at the time was composed of roughly 700 soldiers, or about a fifth of the overall mission requirements for the 39th eSBs deployment to Iraq. In addition, the 41st eSB of the Oregon Army National Guard was now short an infantry battalion and would require a new infantry battalion to fill their ranks if they were required to deploy. The use of a "filler" battalion from the 41st eSB created ripple effects throughout the ARNG eSBs and the National Guard Bureau. The 41st eSB would now need an additional infantry battalion if they were to be mobilized and deployed. The use of battalions to fill unit vacancies within an eSB or a BCT created an avalanche-like effect within the ARNG. The tightly coupled State personnel and recruiting systems, along with a constrained training base, failed to provide the personnel required for this deployment. This trend of using units from another state and another eSB/BCT continued to be a concern for the Army National Guard throughout the decade of the 2000's. The ARFORGEN model only amplified this critical shortfall within the system--it became apparent that the unit would have to meet its manning requirements from within in order to limit the turbulence to the

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[42]Ibid.

[43]Major Craig Heathscott, "Back 2 Iraq," *39th Infantry Brigade Combat Team Arkansas Bowie Edition* (December 2007), http://www.arguard.org/PublicAffairs/BowieEdition/07-12Bowie_ reformat_view.pdf (accessed January 16, 2010).

[44]Tim King, "Oregon Guard Prepares for Iraq Deployment," *Salem News* (July 4, 2009) http://www.salem-news.com/articles/july042009/41st_sendoff_7-4-09.php (accessed January 16, 2010).

specific microstate of the BCT. This would not be the last time the 39th Brigade would face personnel challenges for an operational deployment. Although the 2-162 Infantry Battalion was sent to the 39th in time for them to train with their new Brigade, additional problems would emerge during the 39th eSBs deployment to Iraq in 2008.

According to Major Chad Bridges, a member of the 2-153rd Infantry Battalion at the time, "The mission created a big problem when Soldiers' involuntary time ran out half way through the mission. The problem went all the way to SECDEF and no one knew what would happen. Many soldiers redeployed in the middle of the mission."[45] The lack of coherent personnel policies and operational demands created a major issue for the 39th eSB. Many soldiers who deployed to the MFO-Sinai mission were recalled involuntarily, and the policy limitations for involuntary mobilizations had begun to run out. The numerous mobilizations had created a legal and personnel issues for the members of the 39th eSB. No one within the Army National Guard or the Active Component had understood the relationship between the laws and policies determining the use of Reserve Component personnel and the 39th eSBs multiple deployments. This lack of holistic understanding of the rules and regulations associated with Reserve Component personnel led to a significant disruption of the 39th eSBs mission in Iraq. It was another example of tight coupling of the Reserve Component personnel system at work. The 18-month mobilization for the 39th eSB, along with the 30th eSB and the 81st eSBs was a driving factor in the Secretary of Defense's 12-month mobilization policy. The chaos caused by the lack of understanding of personnel policies and the 39th's inability to man their Brigade fully was caused by the tight coupling of policies and mission requirements.

When the 39th eSB redeployed to Arkansas in 2005, not much was expected from the unit until the next potential deployment occurred sometime in the future. Unfortunately for the

[45]Major Chad Bridges, interview by author, Fort Leavenworth, KS., January 26, 2010.

soldiers of the 39th BCT, they not only had to undergo the Army transformational process known as Modularity between these deployments, but they also had to stay alert for Title 32 or State Active Duty missions on order from the Governor. Even with those two requirements looming, the 39th BCT was not prepared for their next mission, which occurred far sooner than anyone could have anticipated.

On August 29, 2005, Hurricane Katrina made landfall on the Gulf Coast of the United States. Richard Knabb, Jamie Rhome, and Daniel Brown from the National Hurricane Center wrote an after-action report entitled "Tropical Cyclone Report: Hurricane Katrina, 23-30 August 2005." In this report, they stated: "It was the costliest and one of the five deadliest hurricanes to ever strike the United States…the damage and loss of life inflicted by this massive hurricane in Louisiana and Mississippi were staggering…."[46] In response, the 39th BCT was part of a large scale humanitarian relief effort to help the citizens of Louisiana. Captain Wendell Taylor, the Commander of Alpha Company Task Force, TF Gunslinger, wrote in a newsletter article "More than 500 hundred men and women from the 39th Infantry Brigade are assisting with recovery efforts of Hurricane Katrina in New Orleans, LA."[47] Captain Taylor also identifies two units from the Arkansas Army National Guard who deployed to New Orleans. "The majority are 39th Brigade troops from the 2-153rd Infantry and Support Battalion.…"[48] This unexpected deployment for the 2-153rd Infantry Battalion was an added stress to troops who had already served in Iraq, the Sinai, and Saudi Arabia. This was their fourth deployment out of state in six years and not only created disruption in the lives of their soldiers, but it also severely hindered the BCTs transition to a Modular Brigade Combat Team as their soldiers were being utilized in

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[46]Daniel P. Brown, Richard D. Knabb, and Jamie R. Rhome, "Tropical Cyclone Report: Hurricane Katrina, 23-30 August 2005," http://www.nhc.noaa.gov/pdf/TCR-AL122005_Katrina.pdf (accessed January 16,2010).

[47]Captain Wendell B. Taylor, "Katrina's Mess: Arkansas' 39th Infantry Brigade Lends a Hand in "The Big Easy," website disabled (accessed January 16, 2010).

[48]Ibid.

another operational mission. Task Force Gunslinger spent close to eight months on duty in Louisiana supporting the relief efforts. The effects of the Katrina mission not only led to additional personnel strain on the BCT, the soldier's families and their employers, but it also reduced the amount of time available for training the BCTs soldiers. The lack of available training time would have severe impacts on the BCT when their next operational mission presented itself. However, even before that, another new mission was to quickly emerge for the 39th BCT, and this new mission was unlike anyone had experienced in the past.

The Hurricane Katrina response was the second major operational mission conducted under the authorities present under Title 32 of the US Code. The initial mission was for airport and critical infrastructure security following the 9/11 attacks. Both of these missions set precedents for further use of Army National Guard forces under the laws contained in Title 32, and in June of 2006, Operation Jump Start began. This mission was designed to help enhance Border Patrol activities along the American-Mexican border, and "began when the four governors from the border states--California, Arizona, New Mexico and Texas--recently signed a memorandum of agreement with the Defense Department. It stipulates that the Guard will not participate in 'overt' law enforcement."[49] The Army National Guard was asked to provide volunteers for this mission, mainly because states were not willing to send units for extended periods of time to the four border states. The 39th BCT had numerous volunteers for this mission, as "In December 2006, the 1st Battalion deployed a 70-man detachment of Headquarters and Headquarters Battery for service on the South West Border in support of Operation Jump Start, serving there until the 1st Battalion received it's [sic] alert for the current mobilization."[50]

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[49]Steven Donald Smith "Operation Jump Start' Puts 2,500 Guardsmen on Southern Border in June," *American Forces Press Service,* http://www.defense.gov/news/newsarticle.aspx?id=16109 (accessed January 16, 2010).

[50]Globalsecurity.org, "1-206 Field Artillery," http://www.globalsecurity.org/military/agency/army/1-206fa.htm (accessed January 26, 2010).

It is difficult to gauge how many soldiers rotated through the HHB, 1-206th because volunteers throughout the BCT were present along the border during the two years of the mission. While this mission was small in stature, with a couple of hundred troops from the 39th BCT volunteering at the very most, it nonetheless signified the growing use of Army National BCTs for Homeland Security missions. The 39th BCT had now sent troops and units to six major named operations since 1999, but there was one more major operation to undertake. It was to a place where they had been a few years earlier; it was back to Iraq for the soldiers of the 39th IBCT.

The last operational mission for the 39th BCT was going to be familiar in many respects, as the BCT still had many members from their initial deployment to Iraq in 2004. The BCT had finished the conversion to a Modular unit, but because of the numerous operational missions between 2005 and 2007, they were not at a high state of readiness. To start with, the 39th BCT was unable to fully man their units, and was forced to ask for outside assistance. Unlike 2003, when the 2-162nd Infantry Battalion was used as the major replacement unit, the 39th BCT was able to fill out their ranks from within the Arkansas Army National Guard. In this instance, "Maj. Slade McPherson, personnel officer for the Brigade, quickly realized he would need a long arm to reach outside the Brigade for nearly 1,000 additional Soldiers to attain the required numbers. The answer was simple, the Arkansas Army National Guard."[51] There were a number of units from within the Arkansas Army National Guard that were used to cross-level personnel into the BCT.[52] Cross-leveling of personnel allowed the 39th BCT to reach their required mission strength, but by taking these personnel, these other units were now weakened, and potentially would have to cross-level personnel from yet another Arkansas Army National Guard unit. The ARFORGEN

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[51]Major Craig Heathscott, "Back 2 Iraq," *39th Infantry Brigade Combat Team Arkansas Bowie Edition* (December 2007), 16. http://www.arguard.org/PublicAffairs/BowieEdition/07-12Bowie_ reformat_view.pdf (accessed January 16, 2010).

[52]Ibid., 17.

cycle had created a new paradigm. In the past, cross leveling was acceptable because other units might not have been required for deployment. With two wars and numerous other peacekeeping requirements still requiring tens of thousands of Army National Guard troops on annual basis, the practice of cross leveling now became a risky proposition for the States. The loose coupling of other states filling specific state BCTs personnel shortages was ending. A new paradigm, based on a tight coupling perspective, would emerge as states now were expected to fill their personnel shortages from within their state. Even so, if individual states cross-leveled personnel from within other units within their state that were not in the "Available Year" of the ARFORGEN cycle, it still weakened those units for potential new deployments. State leadership would have to balance the immediate needs of their mobilizing units and the potential for future deployments. Many soldiers in "low density, high demand" military occupational specialties would be at higher risk because of the lack of these soldiers and the increased demand for them within almost every battalion and higher sized unit. This became another example of the lack of counterintuitive thinking associated with the ARFORGEN cycle within the Army National Guard.

Secondly, the 39th BCT was not at the required training readiness level they when they were preparing for mobilization. The 39th BCT asked for, and received, additional funding and permission to prepare a large block of time during the pre-mobilization period for individual and collective training for deployment to Iraq. Lieutenant Colonel Thomas Weiss, in an Army War College research project, examined this issue and found that, "The 39th IBCT then put the entire mobilizing force on duty from October 10, 2007 through the mobilization date, December 21, 2007."[53] This was another new paradigm as the 39th's request was unique both in its scope and in the fact that it was approved. This new training standard was not received well by many in the Department of Defense, however. The Secretary of Defense may have allowed the 39th BCT

[53]Thomas J. Weiss, "National Guard Premobilization Training Certification: 54 Ways to Skin a Cat," (master's thesis) Carlisle, PA. (March 2008), http://www.dtic.mil/cgibin/GetTRDoc?AD= ADA479018&Location=U2&doc=GetTRDoc.pdf (accessed January 26, 2010).

additional pre-mobilization time, but he waited for over two years before deciding on implementing this policy across the Army National Guard. In a press release dated November 19, 2009, he even hedged on his decision. "Gates told the National Guard Bureau Senior Leadership Conference he wasn't initially a fan of the so-called 'contiguous mobilization' plan he approved earlier this month at the Army and National Guard leadership's request."[54] The 39th BCT was an innovative force in training management for the Army National Guard, but it was not planned in this manner. The continual deployments of the BCT from 1999-2009 had wrecked havoc on the soldiers and units within the BCT. The 39th IBCT returned from duty in Operation Iraqi Freedom in January of 2008, completing a ten year stretch of duty that sent members of the BCT from the Mexican Border to the Sinai and over to Iraq.

The 39th BCT is not the only ARNG BCT that has been used in this manner, but they have been used more than any other BCT in the ARNG since 1999. In addition to these operational missions, the 39th BCT had a number of state missions every year. To put this in perspective, "The Directorate of Military Support counted 81 State Active Duty missions in Fiscal Year 2008…."[55] While the 39th BCT was not involved in all of these state active duty missions, they did contribute soldiers to many of them, and these missions will continue as the Governor dictates. The 39th BCT is like every other ARNG unit because it must balance training time, civilian employment and federal operational missions in order to sustain the force. The last decade has been one of great change for the 39th BCT, and as seen by the two operational missions in Iraq, there have been hundreds of soldiers who have left the BCT because of the Operations Tempo. The Army Times editorial from January 18, 2010, has a disturbing quote for

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[54]Donna Miles, "Gates supports 'contiguous training' for reserve component," *American Forces Press Service,* http://www.ng.mil/news/archives/2009/11/111909-Training.aspx?src=rss (accessed February 6, 2010).

[55]U.S. Department of Defense, Arkansas National Guard, *Arkansas National Guard Fiscal Year 2008 Annual Report* (North Little Rock, AR: December 2008).

the long term sustainment of the ARNG BCTs. "Chief of Staff Gen. George Casey, concerned about an "era of persistent" conflict projected to continue to 2028…."[56] With another potential 18 years before the end of this war--not to mention any other wars, humanitarian relief efforts, or widespread use of ARNG BCTs--it will be a continual struggle for the ARNG and the 39th BCT to continue operating without significant strategic effects to their organizations.

The 39th BCT has been the most heavily deployed Brigade in the Army National Guard since 1999. The other 27 ARNG BCTs have also been deployed at least once as a BCT-sized formation to either Afghanistan or Iraq, and many of them have deployed battalion-sized units to these locations as well. Numerous BCTs have also performed missions in the Balkans, the Sinai, and in the United States under Operation Noble Eagle. ARFORGEN has been an attempt to bring certainty, predictability, and stability to Army National Guard soldiers, but it is still too early to understand the long-term impacts of the ARFORGEN cycle on the soldiers and units of the ARNG. ARFORGEN is the first attempt to move away from a tiered readiness concept--where units who would deploy in the first 30 days were prioritized along the DTLOMPF[57] model at the cost of units who would deploy after them--and towards a time driven readiness cycle based upon consistent demand from Combatant Commanders. In the short term, it is necessary to understand that the soldiers of the ARNG BCTs had deployed numerous times before ARFORGEN was institutionalized within the Army, and these deployments had taken a toll on the individual and the ARNG as an institution.

With current dwell times averaging at three years and seven months (the figure of 1:3:58 is estimated in the next chapter), the 39th BCT should expect to be mobilized and deployed again in August of 2011, with their pre-mobilization training period beginning in July of 2011. This

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[56]Editorial, "Bigger Army Necessary," *Army Times*, (January 18, 2010),http://www.armytimes.com/news/2010/01/army_casey_011710w/ (accessed February 6, 2010).

[57]DTLOMPF – Doctrine, Training, Leadership Development, Organization, Material, Personnel and Facilities.

would be the eighth deployment for at least a company-sized element of the BCT since 1999, and the third full BCT deployment since 2004. The men and women of the 39th have met every challenge over the last decade, and will meet this challenge as well, but is it fair to their employers and their families?

Modeling ARFORGEN

In order to gain a more holistic understanding of the stresses the ARNG BCTs are facing under the current ARFORGEN cycle and the associated policies which affect the cycle, it is necessary to use modeling software in order to understand the medium and long term effects upon the BCTs. Planimate is an excellent software tool that allows for the precise mathematical modeling required for medium and long term use of the ARNG BCTs. [58] Planimate can be programmed to show length of time required in multiple phases of a unit deployment to theater, and this allows for analysis of the cumulative effects of the demand for ARNG BCTs since 2006, the current ARFORGEN cycle and the numerous policies which affect the ARNG ARFORGEN cycle.

Figure 1 shows the Planimate model that now needs to be explained in depth. The far left hand category shows the current deployment load for ARNG BCTs. These include four Security Force (SECFOR) missions for Operation Iraqi Freedom, a single Operation Enduring Freedom mission (Task Force Phoenix), and two "Full Spectrum" units supporting Operation Iraqi Freedom. The SECFOR and Task Force Phoenix missions occur annually, while the "Full Spectrum" missions occur every three years. The next category is the amount of time spent in Pre-Mobilization Training, which is modeled for 30 days. After this, the unit is mobilized under Title 10 orders, and spends 45-90 days in Post-Mobilization Training, which is determined by the

[58]Planimate is developed by an Australian software company, Interdynamics, specializing in queuing modeling. Logistics companies often use this software in order to predict time frames associated with moving products from the factory floor, through the transportation network and to the customer/end user.

amount of training successfully completed in the Pre-Mobilization Phase and the specific mission that the BCT is going to undertake once in theater. The following category is the actual "Boots on Ground" time, and this is determined by the length of Post-Mobilization Training, the length of time a BCT requires to perform the Relief in Place (RIP)/Transfer of Authority (TOA) as well as redeploy back to the United States. This has been modeled at 240 to 270 days, depending on the specific mission requirements. The Redeployment block is last, with 30 days being the model for the RIP/TOA and for redeployment back to the United States. The entire mobilization and deployment window is bounded at 13 months/395 days--one month of Pre-Mobilization Training time under Title 32 and twelve months of Title 10 time, to include Post-Mobilization time, Boots of Ground time, and Redeployment time. The current OSD 12-Month Reserve Component Mobilization Policy is in effect during this modeling, as is the recently approved month of Pre-Mobilization Training. The entire model can be run for any length of time--from as little as one year to 200 years--in order to gain short term and long term results of the modeling process. Additional BCTs can also be added to the model if required to show results of "surging" ARNG BCTs into emerging and new mission sets. Active component units can also be modeled easily by modifying their deployment time limits and mission requirements.

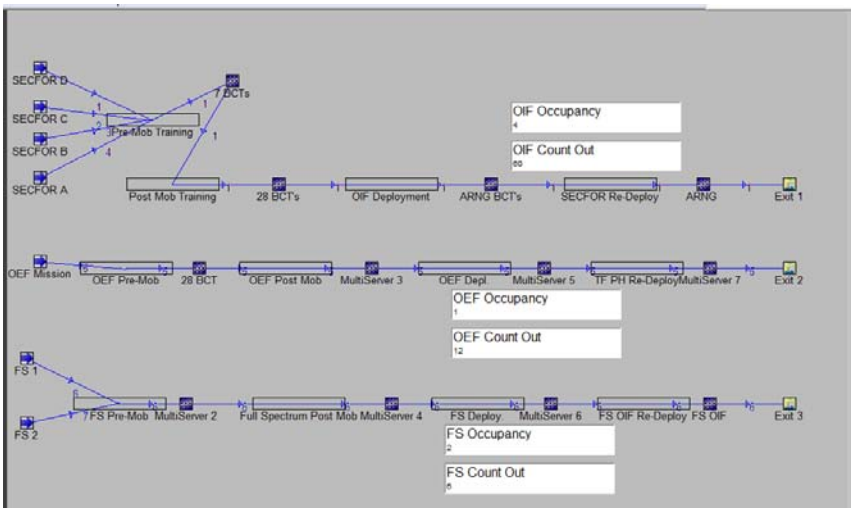

Figure 1. Planimate Model of ARFORGEN Cycle in 2010.

Table 1. Current Dwell Times

Total BCTs	Total Time	Number of Deployments	Deployments per Unit	Time over DpU
28	10	78	2.785714286	3.58974359
28	100	836	29.85714286	3.349282297
28	200	1678	59.92857143	3.337306317

Table 1 shows the results of running the model to establish current dwell times. The first column contains the number of ARNG BCTs. The first three rows show 28 BCTs, which is the total number of BCTs in the current ARNG force structure. The second column is the length of time the model was run for, measured in years. The third column has the total number of deployment for the 28 BCTs over the length of time the model was programmed for. The fourth column shows the total number of deployments for a single BCT over the length of the program. The final column shows the dwell time for the ARNG BCTs, based on current demand from the Combatant Commanders and the OSD 12 Month Reserve Component Mobilization Policy--and over a 10-year period, a BCT has 3.58 years of dwell time, or about 43 months. The first analysis required is for the short term, in this case, a ten-year period with five annual requirements (the four SECFOR and one TF Phoenix BCT) and two Full Spectrum missions every third year. Over ten years, the 28 ARNG BCTs would deploy 2.78 times over that period, and they would have 3.58 years of dwell time between deployments. This is far beneath the stated dwell time goals--five years--of the original ARFORGEN cycle. This means a soldier, if currently in an ARNG BCT and wanting to remain in the BCT, will deploy every 43 months with the current demand for forces. If the model is expanded out to the 100 and 200 year mark, which is unrealistic, but must be done to even out the statistical biases of the initial conditions of the model, then the dwell times shrink from 3.58 in the 10 year model to 3.35 in the 100 year model, and to 3.34 years in

the 200 year model. The inherent statistical bias is so small over the long term to be of no importance to the overall expectations of the BCTs or their soldiers. The results of this modeling are of little surprise. The demand for forces, combined with the 12-month mobilization policy, are the major drivers of reduced dwell time for ARNG BCTs, and the length of the deployments do not significantly change from the short term through the long term.

Table 2. Required Number of BCTs to Sustain Current Demand

Total BCTs	Total Time	Number of Deployments	Deployments per Unit	Time over DpU
39	10	78		5
46.8	10	78		6

This model is a reverse-engineering attempt to show how many BCTs would be required--given current demand rates--in order to sustain current demand and reach five and six years of dwell time. This second section of modeling is more interesting, and as stated earlier, is an attempt to reverse-engineer the ARFORGEN model to show how many BCTs are required to support the current demand for forces under the OSD 12 Month Reserve Component Mobilization Policy. The first column shows the number of BCTs required to sustain the current numbers of missions assigned to the ARNG BCTs. The second column shows the total length of time, in this case, a ten year model which results in 78 missions for the ARNG BCTs, shown in the third vertical column. In order to meet current demand and the initial dwell time required under the 2006 version of ARFORGEN, the ARNG requires 39 BCTs. This is a growth of 11 BCTs for the ARNG, which would be prohibitively expensive for the Army to activate and sustain for any length of time without significantly affecting other existing programs. When the model is expanding to six years of dwell time with the current mission requirements, the situation becomes even worse. The ARNG would need to have 47 BCTs in order to meet current demand

and dwell time requirements. Because both of these scenarios are not affordable in the short and long term, it is necessary to understand how the ARNG BCTs can gain additional dwell time without building more structure while meeting current Combatant Command force structure demands.

Table 3. 15-Month Mobilization Model and Dwell Time Results

Total BCTs	Total Time	Number of Deployments	Deployments per Unit	Time over DpU
28	100	54	1.928571429	5.185185185
30	100	54	1.8	5.555555556

Table 3 has a major difference in the programming. The final two rows show an improved ARFORGEN model with 28 and 30 BCTs respectively, with 15 months of mobilization time and 30 days of pre-mobilization training. In addition, the BCTs have a 12-month "boots on ground" deployment in their specific theater. As shown in the second to last row, the ARNG BCTs dwell time expands to over five years under this construct. In the last row, with two additional BCTs, the dwell time increases to well over five years of dwell time. In both cases, the pre-mobilization training time could be eliminated, or one month of post-mobilization training could be eliminated if the pre-mobilization training was still desired by the BCTs and the ARNG. This now allows for current demand to be sustained, and dwell time for 28 BCTs now exceeds five years. If the ARNG were to grow an additional two BCTs and change the mobilization time to 15 months, there would over five and a half years of dwell time. It is clear that additional mobilization time would increase dwell time for all ARNG BCTs, and provide additional predictability to families and employers. It would also allow current demand rates to be sustained if required.

Conclusion: Reaching the Initial Goals of ARFORGEN

There are many ways the ARFORGEN process can be altered or corrected to meet the initial "1 in 6" time requirements stated in the initial draft of ARFORGEN. These changes can and will allow for a better chance of something close to a "steady state" to emerge for the ARNG BCTs.

The first recommendation is to alter the current OSD 12-Month Reserve Component Mobilization Policy, and extend it to 15 months. There are two major benefits to this recommendation for ARNG BCTs. The first is that it will eliminate the need for two deployment cycles per calendar year for the Army National Guard. One deployment cycle a year allows for greater sustainability of ARNG BCTs because it is a 1 unit for 1 mission in 1-year system. Right now, the ARNG BCTs are trapped in a 2-unit for 1 mission in 1-year system, and this creates greater demand for these forces over an extended period of time (in this case, it causes the ARFORGEN cycle to shrink from a 1 in 5 year cycle to a 3.5 year cycle). The second major benefit of a 15-month mobilization order is that it would synchronize the ARNG BCT ARFORGEN cycle with the Active Component BCT cycle.[59] It would allow for greater flexibility by the senior commanders to deploy and backfill Active or ARNG BCTs as necessary.

An additional recommendation is to grow and activate two ARNG BCTs within the Total Army Analysis process.[60] This would stabilize the ARNG BCT force structure at 30 overall BCTs. Thirty BCTs is divisible by either five or six, and would allow either 5 or 6 BCTs to be mobilized per year to support ongoing operations. The current number of 28 BCTs is not divisible by either number, and creates a mismatch within the ARFORGEN cycle. With the current annual mobilization load for ARNG BCTs being 12-14 per year (5 SECFOR in OIF x 2

[59]Synchronize is the correct term here as it relates to a time driven requirement.

[60]The Total Army Analysis (TAA) process is the Army's way of balancing force structure against existing operational and contingency plans drafted by the Combatant Command staff planners.

mobilization cycles, 1 ANA BCT x 2 mobilization cycles, and 2 "Full Spectrum" BCTs in OIF as required--usually every third year), the ARNG cannot sustain this level of commitment for the "Long War" without destroying employer relations and damaging families. 30 BCTs with a 15-month mobilization order allows for more time at home station, greater time deployed, and provides additional stability for employers, employees and families. The only other way to allow for time at home station is to reduce demand, which is not fully in the purview of the Army leadership because of the supply and demand relationship that exists between the Army and Combatant Commanders.

The third recommendation is to alter the current Equipment Reset policy from a 365-day requirement for the ARNG to a 180 day requirement, which is the Active Component standard. The first year after deployment is now limited to individual and small unit (fire team and squad-level) training because the major end items will not be available for up to 365 days. While this would incur additional costs, it allows ARNG BCTs the ability to train collectively up to the individual vehicle level (primarily armored vehicles, but also artillery pieces and HWMVV's as well). When the current ARFORGEN cycle is hovering around the 1 in 3.58 mark, losing an entire year of collective training is counterproductive to overall readiness, and could increase post-mobilization training time, resulting in shorter "Boots on Ground" time. While additional resources would be required to reduce the Reset timeframe to 180 days, some resources can be saved as Post-mobilization training times would likely be reduced as ARNG BCTs begin collective training earlier in their specific ARFORGEN cycles.

The ARFORGEN cycle suffers from an identity crisis. It is neither a model nor a process. It is shaped by artifacts that are both loosely coupled (policy memos from both higher and subordinate commands) and tightly coupled (the DTLOMPF requirements required by the Combatant Commands and the Army). It is a dynamical system, changing all the time due to new operational requirements, new policy memos, emerging concerns from the individual soldier, his family and the employers, and it does not allow for a steady state to ever become reality during a

time of protracted conflict.[61] But with careful examination and a desire to understand the counterintuitive effects of new policies, the ARNG BCTs can meet the dwell time requirements initially stated by the Army in 2006 while providing trained and ready units to the Combatant Commanders and the Governors. In addition, a mandatory on-line training course on ARFORGEN should be available for all action officers holding the rank of Major through General. A cost-benefit analysis is needed for this recommendation; however, the cost could be contained if the course was taught in various Professional Military Education (PME) schools such as Intermediate Level of Education (ILE), the School for Advanced Military Studies (SAMS) or the Army War College (AWC). It should contain sections on how the ARFORGEN cycle works, what policies currently impact the overall cycle, the intent of ARFORGEN, and how to begin to think in a counter-intuitive manner. The initial goals of ARFORGEN can be met with the current Combatant Command force requirements and with limited changes to ARNG BCT force structure. A simple review of current policies have identified tensions within the microstates and the macrostate, and by altering these policies, it is possible to provide ARNG soldiers with a more predictive mobilization and deployment cycle. It is also possible to distance the ARNG BCTs from a catastrophic collapse as ARFORGEN matures and more policies are enacted over time.

There are multiple opportunities for further research using complexity science as a lens to analyze the ARFORGEN model. One subject worth investigating is the no-Individual Duty for Training (IDT) for 60 days and no-Annual Training (AT) for 180 days policy. The sooner the unit can congregate for an Inactive Duty Training Assembly, the sooner they will feel more of part of something larger than themselves. Because of the decentralized nature of ARNG units, many soldiers do not live near Army bases where they can get health care, nor can they relate

[61]To understand how this term became in vogue, see Robert Strausz-Hupe, "The New Protracted Conflict," *Foreign Policy Research Institute* (April 2002), http://www.fpri.org/enotes/americawar. 20020402. strausz-hupe.newprotractedconflict.html (accessed October 17, 2009).

their feelings with their peers who went through the same hardships while they were deployed. Unit cohesion should also be considered as these units are at the highest state of readiness the day they demobilize--they have just spent 12 months on active duty and most conducted combat operations.

Another investigation is one of education. Personnel assigned to the HQDA Staff, the NGB Staff, the FORSCOM staff, the JCS staff and the OSD staff should ask the question "How does this policy affect the ARFORGEN cycle for the ARNG" before implementation. Numerous policies have been enacted over the last three years that have caused a contraction of the ARFORGEN cycle and training time within the ARFORGEN cycle. These policies were enacted with the well being of the individual soldier in mind, but as is often the case, the second and third order effects upon the ARFORGEN cycle were not anticipated or understood at the time of implementation. Educating officers in ARFORGEN is no small task--Army schools have a zero-sum curriculum, meaning an existing block of instruction needs to be removed or shortened in order to introduce a new block of instruction. A cost/benefit analysis would be necessary in order to justify a new block of instruction as well. One critical area of future investigation is to examine the differences between Title 32/State Active Duty mobilization time and Title 10 mobilization time. The 39th IBCT is a perfect example of how numerous Title 32 missions (Katrina Response, Operation Jump Start) mobilized ARNG soldiers within the "Reset" or "Ready" force pools. When these missions occur, it takes soldiers away from their employers and families, and they frankly do not care what legal statute is in effect. If the accumulated Title 32/State Active Duty time is over six months of duration within the unit ARFORGEN cycle, then they should be dropped back a year, and either replaced with another unit from the ARNG, or from the Active Component, to meet operational demands. The failure to do so creates additional post-mobilization time for these units as they are not training on their wartime Mission Essential Training List [METL], and can lead to additional stresses with employers and families. As Lieutenant General Michael Rochelle, then the Army Deputy Chief of Staff for Personnel stated,

"It's either active duty or it's not…."[62] This must be balanced between unit requirements and individual requirements as the low density MOS issue is present regardless of the Title 32 or Title 10 time. It also reduces stress on employers, as they do not understand the subtle legal differences between Title 32 and Title 10. To them, an employee is no longer working for them, and they must either find a replacement, or eliminate the position until the solider returns after his deployment is completed.

There are other areas of future learning as well. One intriguing area of study is would examine the tensions between the funding levels of a BCT as it progresses through a compressed ARFORGEN model versus the funding levels associated with a "steady state" ARFORGEN model. Another area of learning would concentrate on the microstates affecting a specific BCT using the DTLOMPF model, as this would potentially identify emerging issues within the BCT or the State the BCT is located in. Another fascinating case study would examine specific non-BCT units over the last decade such as Combat Aviation Brigades--a unit composed of highly skilled personnel from the enlisted, warrant officer and commissioned officer ranks. A spin-off of this study could examine the inherent friction between high demand, low-density units and high-demand, low-density personnel within the ARNG. Because ARFORGEN and complexity science are so new, with emerging issues and problems occurring frequently, there literally is no limit to further study. As time passes, more papers, monographs, and books should become available that add to the limited sources of information concerning ARFORGEN. This alone should ease future study of the ARFORGEN model, and the impacts it has had on the Army, and the Army National Guard.

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[62]Elizabeth M. Collins and Gary Sheftick, "Army Operationalizing Reserve Component," *Army News Service* (October 10, 2008), http://www.ng.mil/news/archives/2008/10/102308-Army_reserve.aspx (accessed October 17, 2009).

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